

State of California
AIR RESOURCES BOARD

PROPOSED

**SPECIFICATIONS FOR FILL PIPES AND OPENINGS OF
2015 AND SUBSEQUENT MODEL MOTOR VEHICLE FUEL TANKS**

Adopted: March 22, 2012

Amended: [INSERT DATE OF AMENDMENT]

Note: The proposed amendments to this document are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions compared to the test procedures as adopted March 22, 2012. [No change] indicates proposed federal provisions that are also proposed for incorporation herein without change. Existing intervening text that is not amended in this rulemaking is indicated by “* * * *”.

NOTE: This document is incorporated by reference in section 2235, title 13, California Code of Regulations (CCR). Additional requirements necessary to complete an application for certification of motor vehicles are contained in other documents that are designed to be used in conjunction with this document. These other documents include:

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7. "Application for Compliance with Fill Pipe Requirements"

SPECIFICATIONS FOR FILL PIPES AND OPENINGS OF MOTOR VEHICLE FUEL TANKS

I. General

A. No new 2015 or later model year gasoline or alcohol fueled passenger car, light-duty truck, medium-duty vehicle, or heavy-duty vehicle may be sold, offered for sale, or registered in California unless such vehicle complies with the following specifications for fill pipes and openings of motor vehicles fuel tanks. The Executive Officer may exempt vehicles for which compliance with the specifications is found to be technologically infeasible, in accordance with Paragraph 9.

B. Evidence to show compliance with these specifications shall be submitted to the Executive Officer of the Air Resources Board with the application of certification of new vehicles required by Chapter 3, Subchapter 1, Article 2, of Title 13 of the California Code of Regulations. The Application for Compliance with Fill Pipe Requirements form shall be submitted as part of the application.

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II. Definitions

These test procedures incorporate by reference the definitions set forth in the International Organization for Standardization standard (ISO) "Road vehicles – Filler pipes and openings of motor vehicle fuel tanks – Vapour recovery system" (ISO-13331-1995(E)), as adopted June 1, 1995; the "California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles;" and the "California Exhaust Emission Standards and Test Procedures for 2009 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes," including the incorporated definitions from the Code of Federal Regulations. In addition, the following definitions apply:

* * * *

2. “Vapor recovery nozzle”, for the purpose of these specifications, means a nozzle, unleaded or leaded as appropriate for fueling vehicles, certified by the state board, pursuant to the latest version of the board’s “Certification procedures for Gasoline Vapor Recovery Systems at Service Stations” “Certification of Vapor Recovery Systems of Dispensing Facilities” established in Section ~~94004~~ 94011 of Title 17, California Code of Regulations, ~~at any time between January 1, 1981 and September 14, 1982,~~ together with an appropriate vapor hose. ~~An alternative vapor recovery nozzle means any nozzle certified subsequent to September 14, 1982.~~

* * * *

6. “Fill pipe head” means upper portion of the fill pipe which vapor recovery nozzle would contact during refueling.

III. General Design Specifications

The fill pipe and opening of the vehicle fuel tank shall conform to all specifications in the ISO standard “Road vehicles – Filler pipes and openings of motor vehicle fuel tanks – Vapour recovery system” (ISO-13331-1995(E)), as adopted June 1, 1995 and incorporated by reference herein, along with the modifications and additions below. For filler pipes with threaded-type caps, manufacturers may elect to use the alternate filler pipe sealing surface shape specified in the Society for Automotive Engineers (SAE) standard “Fuel Tank Filler Cap and Cap Retainer Threaded” (J1114), as amended August 4, 2005 and incorporated by reference herein. The alternate shape allowance would be used in lieu of section 3.1 of ISO-13331-1995(E); all other provisions of ISO-13331-1995(E) would need to be met by a manufacturer utilizing the SAE J1114 provision, along with the modification below:

- A. Fill pipe sealing surface, adding to ISO 13331-1995(E)), as adopted June 1, 1995 Section 3.1:
 - a. “Fill pipe sealing surface” means portion of the fill pipe face which would contact the vapor recovery nozzle boot face. For purposes of this specification, this is the portion of the fill pipe face which would contact the 45 degree tapered zone in Figure A.
 - b. Diameter of the sealing surface of the fill pipe shall have a maximum diameter of 57.5 mm, and the convex portion shall have a maximum radius of 6 mm.
 - c. Fill Pipe surfaces outside of the 57.5 mm diameter of the sealing surface are allowable so long as it does not infringe into the 45 degree tapered access zone, which extends to a maximum depth of 12 mm

back from the sealing surface of the fill pipe as described in Figure A, access zone below.

- d. These added provisions shall be implemented based on the phase-in schedule in Section XII.

B. Update internal locking lip depth, modifying ISO 13331-1995(E) Section 3.2:

- a. The depth of the lip shall not be less than 4 mm nor more than 10 mm into the filler pipe as measured in the reference plane, from the filler pipe sealing surface.
- b. The depth of the locking lip shall be measured down to its deepest edge (edge facing the fuel tank).
- c. This update shall be implemented based on the phase-in schedule in Section XII.

C. Supplement to access zone, adding to ISO-13331-1995(E) section 3.3:

- a. The fill pipe and any other vehicle parts shall not occupy space defined by the supplemental access zone shown in Figure A below. The supplemental access zone is centered on the axis of the fill pipe sealing surface's outer diameter.
- b. This supplement shall be implemented based on the phase-in schedule in Section XII.

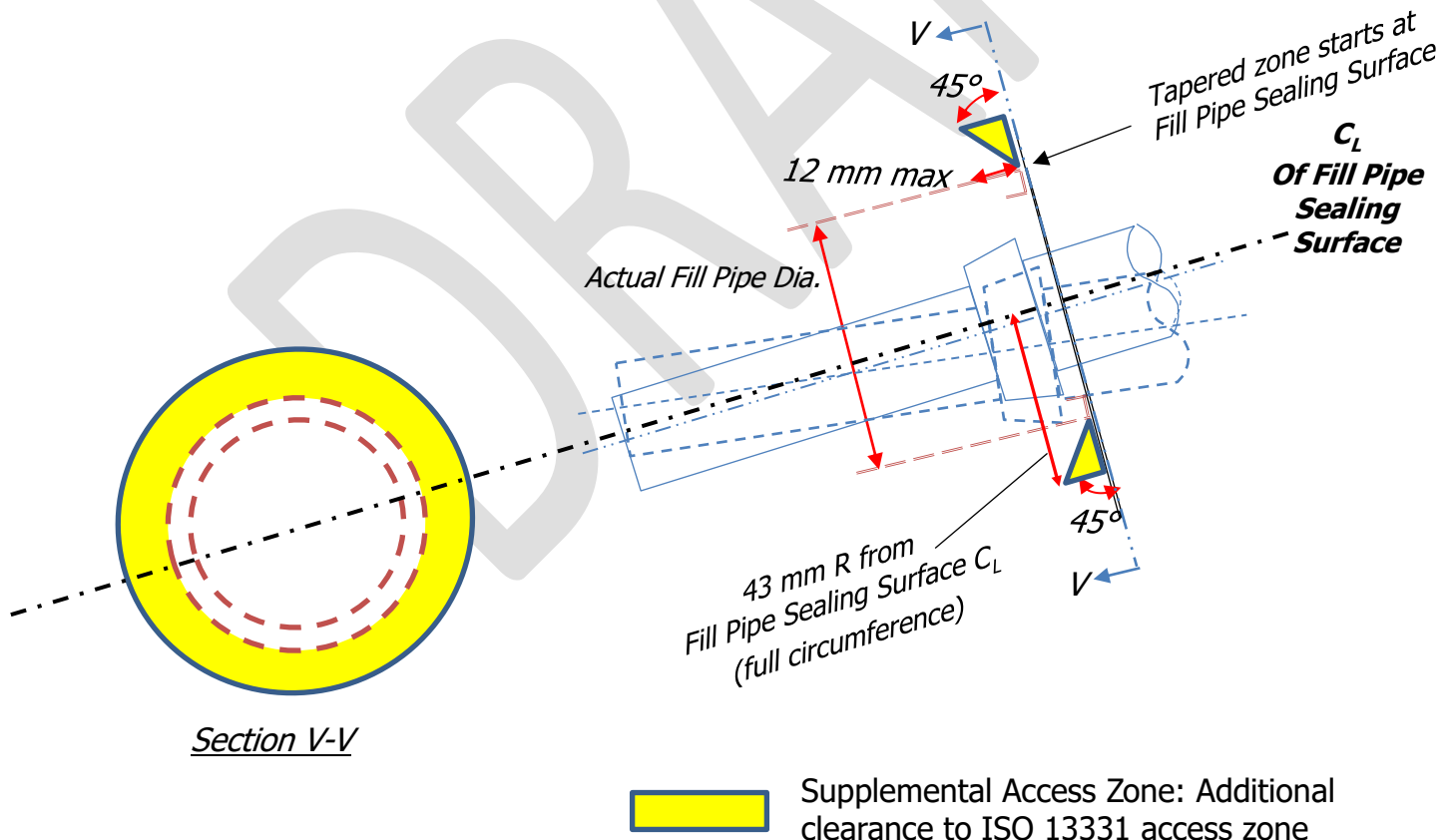


Figure A: Supplemental access zone

- D. Fill pipe outer diameter modification, modifying (SAE) standard “Fuel Tank Filler Cap and Cap Retainer Threaded” (J1114), as amended August 4, 2005.
- a. For the “Alternate Shape”, the outermost diameter of the fuel tank cap retainer (the fill pipe) shall be a maximum of 57.9 and a minimum of 56.9.
 - b. This modification shall be implemented based on the phase-in schedule in Section XII.

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V. Spillage and Spitback Specifications

A. There shall be no more than 1 ~~millimeter~~ milliliter of liquid gasoline loss per test in 90 percent of the tests using the test procedures described in ~~Section 6~~ Section 7.

B. ~~There shall be no unlatching of the vapor recovery nozzle during dispensing or upon nozzle shut-off using the test procedure described in Section 6.~~ The nozzle shall remain in the normal resting position during dispensing and after nozzle shut-off using the test procedure described in Section 7.

VI. Bench Leak Rate Specification

- A. Nozzle to Fill Pipe Interface Bench Leak Rate:
- a. Bench Leak Rate: At 500 +/- 25 Pascal vacuum, the maximum allowable leak rate is 2.5 Standard Liters per Minute (SLPM), using the procedure described in Section 8.
 - b. Shall be implemented based on the phase-in schedule in Section XII.
 - c. A separate test shall be performed on each individual fill pipe head configuration.

VI.VII. Test Procedures: Fill Rate, Spillage, and Spitback

The following test procedures and test conditions shall be used for determining compliance with the Fill Rate, Spillage, and Spitback specifications in Section 4 and 5.

A. Each different fill pipe/tank configuration, as appropriate to represent adequately the manufacturer's product line, shall be tested with two vapor recovery nozzles. Each nozzle must be from a different manufacturer. ~~At least one~~ One of the two nozzles shall be a balance-type, and the other shall be an assist type. Each nozzle

shall include a hold-open clip for hands-off dispensing. Upon the request of a vehicle manufacturer, the Executive Officer or his designate may approve alternate vapor recovery nozzles and hoses for use with the test procedures.

* * * *

F. Each test shall be conducted as follows:

At the start of the test the fuel tank shall be approximately 10 percent of the nominal tank capacity. The nozzle to be ~~sued~~ used for dispensing gasoline shall be in the normal hands-off-latched position. The fill rate shall be the minimum rate necessary to demonstrate compliance with the applicable fill rate specification set forth in Section 4. The nozzle shall be allowed to dispense gasoline until automatic nozzle shut-off.

* * * *

G. A minimum of five tests with each chose nozzle shall be completed to demonstrate compliance with the fill rate and spillage/spitback specifications. If there is any premature nozzle shut-off or instance of liquid gasoline loss greater than 1 ~~millimeter~~ milliliter during the first five test with any chosen nozzle, a minimum of ten tests with that nozzle shall be completed to demonstrate compliance with the fill rate and spillage/ spitback specifications.

VIII. Test Procedure: Bench Leak Rate

A. Secure the test fill pipe into the fill pipe mounting fixture.

a. Fill pipe should be oriented such that:

- i. Fill pipe opening, at center, is at a height of 36 +/- 1 inches above the ground for passenger car fill pipes, and 41 +/- 1 inches above the ground for light, medium, and heavy duty truck fill pipes.
- ii. Pipe axis angle with respect to horizontal meets the vehicle manufacturer's specification for spill prevention angle, within +/- 2 degrees.
- iii. Internal locking lip degrees on each side of the vertical reference plane, meets the vehicle manufacturer's specification, within +/- 5 degrees.

B. Interconnect the fill pipe, flow meter, pressure gage, and vacuum source, as shown in Figure B.

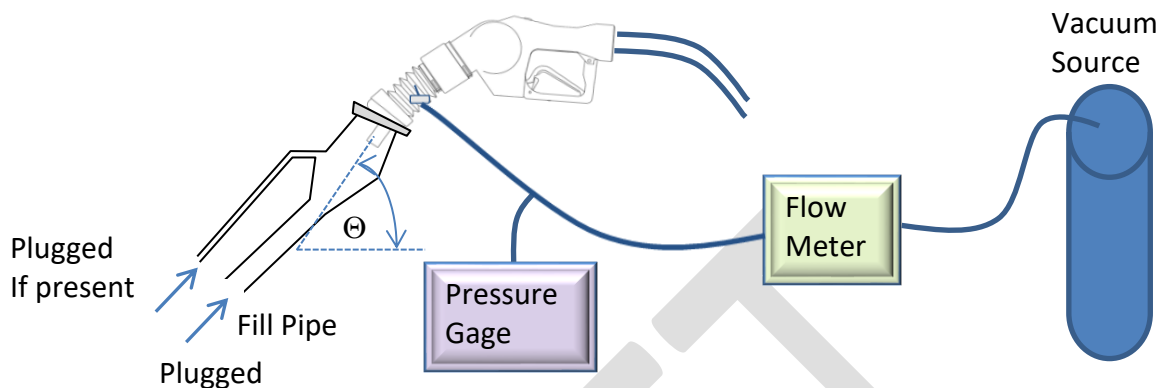


Figure B: Set-up of Testing Equipment

- C. The outlet of the fill pipe shall be plugged.
- D. If the fill pipe has a recirculation line, it shall be plugged.
- E. Latch an assist type vapor recovery nozzle into the fill pipe using a natural motion as you would when filling up your own car at a gas station.
- F. Hose should form a “U” shape, and be within 6-12 inches from the ground at its lowest point.
- G. Adjust the vacuum source until a vacuum level is stabilized to vary no more than 500 +/- 50 Pascal over a two minute period during which no adjustments are made.
 - a. Record the flow rate at a vacuum of 500 +/- 25 Pascal.
- H. The above measurement shall be repeated two more times after re-latching the nozzle.
- I. Average of the three flow rate measurements shall meet the specification as indicated in Section 6.

VII-IX. Specifications to Reduce Damage to Vapor Recovery Nozzles

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VIII-X. Fill Pipe Assembly and Restriction Device Durability and Other Specifications

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IX-XI. Exemption of Vehicles

A. A manufacturer may apply for an exemption from the fill pipe and fuel tank opening specifications in paragraphs 3 through 8~~10~~ for any of its vehicles by applying in writing to the Executive Officer. Application should be submitted at least 60 days prior to the manufacturer's date for final design commitment. The application shall set forth:

1. the specific models for which the exemption is sought;
2. for each such model all facts which demonstrate that compliance with the specifications is technologically infeasible; and
3. evidence showing what efforts have been and will be made by the manufacturer to overcome technological infeasibility, and what the state-of-art technology and problems consist of.

B. Upon receipt of an exemption application, together with sufficient supporting evidence, the Executive Officer may make a finding of technological infeasibility and grant an exemption. The exemption may be limited to specific models, specified body styles of any vehicle model, and/or specified model years. In determining whether to grant an exemption, the Executive Officer shall consider technologies available to the motor vehicle industry as a ~~while~~ whole. The Executive Officer may condition an exemption upon a commitment by the manufacturer to develop new technologies in accordance with a responsible compliance schedule approved by the Executive Officer. No exemption shall be granted unless the manufacturer has demonstrated a good faith effort to overcome technological infeasibility.

C. The manufacturer shall bear the responsibility for submitting evidence to the Executive Officer sufficient to justify the granting of an exemption.

XII. Phase-in schedule (for specifically noted specifications in Section III and VI)

A. This phase-in schedule only applies to the specific requirements as indicated in Section III and VI. Otherwise all requirements in this document are considered effective for the 2015 and subsequent model year.

B. For the specific requirements which are subject to a phase-in schedule, for each model year, a manufacturer shall certify, at a minimum, the specified percentage of its vehicle fleet to these standards according to the implementation schedule set forth below. For the purpose of this section XII, the manufacturer's vehicle fleet consists of the vehicles produced and delivered for sale by the manufacturer in California that are subject to this specification.

<u>Model Years</u>	<u>Minimum Percentage of Vehicle Fleet⁽¹⁾</u>
<u>2022</u>	<u>25</u>
<u>2023</u>	<u>50</u>
<u>2024 and subsequent</u>	<u>100</u>

(1) Small volume manufacturers are not required to comply with the phase-in schedule set forth in this table. Instead, they shall certify 100 percent of their 2024 and subsequent model year vehicle fleet to the specific requirements for which this document indicates to use a phase-in schedule.